WE CLAIM:

1. A method for the nondestructive evaluation of tension wires embedded in a concrete pole, comprising the steps of:

establishing a DC magnetic field needed for MsS operation on the concrete pole;

applying a pulse of AC magnetic field that generates a guided wave in the tension wires based on the magnetostrictive effect;

detecting the guided wave signals reflected from the ends of the tension wires and the ends of the concrete pole based on the inverse magnetostrictive effect;

analyzing and correlating the detected signal with patterns of changes known to be indicative of a break or breaks in the tension wires;

wherein the above steps are effected without physically contacting the tension wires, and

wherein said steps of establishing a DC magnetic field, applying a pulse of AC magnetic field, and detecting the guided wave signals are each effected from a single location on the pole.

2. The method of claim 1, wherein said step of establishing a DC magnetic field comprises positioning a permanent or electromagnetic bias magnet on the concrete pole at a location where no rebars are present in a sectional plane of the concrete that is perpendicular to the longitudinal direction of the pole.

3. The method of claim 1, wherein said step of applying a pulse of AC magnetic field comprises the step of encircling the concrete pole with MsS coils at the location where the DC magnetic field has been established, and then applying a pulse of electric current of suitable frequency through the coil so as to generate the guided waves in the tension wires based on the magnetostrictive effects.

4. The method of claim 3 wherein said step of detecting the guided wave signals reflected from the tension wires and ends of the concrete pole is effected by using the MsS coils and analyzing the detected signals for broken wires.

5. A method for the nondestructive evaluation of tension wires embedded in a concrete pole, comprising the steps of:

establishing a DC magnetic field needed for MsS operation on the concrete pole;

applying a pulse of AC magnetic field to simultaneously generate a guided wave simultaneously in the tension wires based on the magnetostrictive effect;

detecting the guided wave signals reflected from the ends of the tension wires and the ends of the concrete pole based on the inverse magnetostrictive effect;

analyzing and correlating the detected signals with patterns of changes known to be indicative of a break in some or all of the tension wires;

wherein the above steps are effected without physically contacting the tension wires, and

wherein said steps of establishing a DC magnetic field, applying a pulse of AC magnetic field, and detecting the guided wave signals are each effected from a single location on the pole.

6. The method of claim 5, wherein said step of establishing a DC magnetic field comprises positioning a permanent or electromagnetic bias magnet proximate to the tension wires.

7. The method of claim 5, wherein said step of applying a pulse of AC magnetic field comprises the step of placing an electromagnetic coil proximate to the tension wires, and then varying an electric

current through the electromagnetic coil so as to produce magnetostrictive effects within the tension wires.

8. The method of claim 5, wherein said step of detecting the guided wave signals comprises the step of placing an electromagnetic pickup coil proximate to the tension wires, and detecting variations in a voltage induced in the electromagnetic coil caused by an inverse magnetostrictive effect within the tension wires.

9. A method for the nondestructive evaluation of a tension wire embedded in a concrete pole, comprising the steps of:

establishing a DC magnetic field needed for MsS operation on the concrete pole;

applying a pulse of AC magnetic field that generates a guided wave in the tension wire based on the magnetostrictive effect;

detecting the guided wave signal reflected from the end of the tension wire and the ends of the pole based on the inverse magnetostrictive effect;

analyzing and correlating the detected signal with patterns of changes known to be indicative of a break in the tension wire;

wherein the above steps are effected without physically contacting the tension wire, and

wherein said steps of establishing a DC magnetic field, applying a pulse of AC magnetic field, and detecting the guided wave signal are each effected from a single location on the pole.

10. The method of claim 9, wherein said step of establishing a DC magnetic field comprises positioning a permanent or electromagnetic bias magnet proximate to the tension wire.

11. The method of claim 9, wherein said step of applying a pulse of AC magnetic field comprises the step of placing an electromagnetic coil proximate to the tension wire, and then varying an electric current through the electromagnetic coil so as to produce magnetostrictive effects within the tension wire.

12. The method of claim 9 wherein said step of detecting the guided wave signal comprises the step of placing an electromagnetic pickup coil proximate to the tension wire, and detecting variations in a voltage induced in the electromagnetic coil caused by an inverse magnetostrictive effect within the tension wire.

13. The method of claim 12, wherein the electromagnetic pickup coil is a U-shaped MsS probe.